**Final Project Report Template**

**Milestone 1: Project Initialization and Planning Phase**

The "Project Initialization and Planning Phase" marks the project's outset, defining goals, scope, and stakeholders. This crucial phase establishes project parameters, identifies key team members, allocates resources, and outlines a realistic timeline. It also involves risk assessment and mitigation planning. Successful initiation sets the foundation for a well-organized and efficiently executed machine learning project, ensuring clarity, alignment, and proactive measures for potential challenges.

**Activity 1: Define Problem Statement**

Problem Statement: Panic disorder presents a significant challenge in mental health care due to its unpredictable nature and debilitating impact on individuals. Current diagnostic methods often rely on subjective assessments, leading to delayed or inaccurate diagnoses. Treatment efficacy is hindered by the heterogeneous nature of symptoms and individual responses to therapy.

**Activity 2: Project Proposal (Proposed Solution)**

Utilizing machine learning algorithms to analyze comprehensive datasets including physiological indicators, behavioral patterns, and treatment outcomes, we aim to develop predictive models for panic disorder. These models will enhance early detection through the identification of subtle pre-attack signals and risk factors. Furthermore, machine learning can optimize treatment strategies by predicting individual response patterns to various therapeutic interventions. By leveraging data-driven insights, we seek to improve the overall management and quality of life for individuals suffering from panic disorder.

**Activity 3: Initial Project Planning**

Initial Project Planning involves outlining key objectives, defining scope, and identifying

Patients symptoms and behaviour for making panic disorder detection model. It encompasses setting timelines, allocating resources,and determining the overall project strategy. During this phase, the team establishes a clear understanding of the dataset, formulates goals for analysis, and plans the workflow for data

processing. Effective initial planning lays the foundation for a systematic and well-executed

project, ensuring successful outcomes.

**Milestone 2: Data Collection and Preprocessing Phase**

The Data Collection and Preprocessing Phase involves executing a plan to gather relevant loan

application data from Kaggle, ensuring data quality through verification and addressing missing values.

Preprocessing tasks include cleaning, encoding, and organizing the dataset for subsequent exploratory

analysis and machine learning model development.

**Activity 1: Data Collection Plan, Raw Data Sources Identified, Data Quality**

**Report**

The dataset for "Panic-Disorder-Detection" is sourced

from Kaggle. It includes many categorical values as input and output as panic disorder diagnosis. Data quality is ensured through data cleaning and converting categorical values to numericalthorough verification, addressing missing values, and maintaining adherence to ethical guidelines,establishing a reliable foundation for predictive modeling.

**Activity 2: Data Quality Report**

The dataset for "Panic-Disorder-Detection" is sourced

from Kaggle. It includes much more as 14 inputs as categorical data. Data quality is ensured through

thorough verification, addressing missing values, and maintaining adherence to ethical guidelines,

establishing a reliable foundation for predictive modeling.

**Activity 3: Data Exploration and Preprocessing**

Data Exploration involves analyzing the Panic-Disorder of patient from  dataset to understand patterns,distributions, and outliers. Preprocessing includes handling missing values, scaling, and encoding categorical variables. These crucial steps enhance data quality, ensuring the reliability and effectiveness of subsequent analyses in the loan approval project.

**Milestone 3: Model Development Phase**

The Model Development Phase entails crafting a predictive model for Panic-Disorder-Detection. It encompasses

strategic feature selection, evaluating and selecting models (Random Forest,Multilinear Regression, Random Forest Classifier, XGBoost),

initiating training with code, and rigorously validating and assessing model performance for informed

decision-making in the detecting the disorder for each input

Activity 1: Feature Selection Report

The Feature Selection Report outlines the rationale behind choosing specific features (e.g.,

Gender, Age, ) for the loan approval model. It evaluates relevance, importance,

and impact on predictive accuracy, ensuring the inclusion of key factors influencing the model's ability to discern credible loan applicants.

**Activity 2: Model Selection Report**

The Model Selection Report details the rationale behind choosing Random Forest, Decision Tree,

AdaBoost, and XGBmodels for loan approval prediction. It considers each model's strengths in

handling complex relationships, interpretability, adaptability, and overall predictive performance,

ensuring an informed choice aligned with project objectives.

**Activity 3: Initial Model Training Code, Model Validation and Evaluation Report**

The Initial Model Training Code employs selected algorithms on the loan approval dataset, setting the foundation for predictive modeling. The subsequent Model Validation and Evaluation Report rigorously assesses model performance, employing metrics like accuracy and precision to ensure reliability and effectiveness in predicting loan outcomes.

**Milestone 4: Model Optimization and Tuning Phase**

The Model Optimization and Tuning Phase involves refining machine learning models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

**Activity 1: Hyperparameter Tuning Documentation**

The Random Forest Classifier was selected for its superior performance, exhibiting high accuracy during hyperparameter tuning. Its ability to handle complex relationships, minimize overfitting, and optimize predictive accuracy aligns with project objectives, justifying its selection as the final model.

**Activity 2: Performance Metrics Comparison Report**

The Performance Metrics Comparison Report contrasts the baseline and optimized metrics for various models, specifically highlighting the enhanced performance of the Random Forest Classifier model. This assessment provides a clear understanding of the refined predictive capabilities achieved through hyperparameter tuning.

**Activity 3: Final Model Selection Justification**

 The Final Model Selection Justification articulates the rationale for choosing Random Forest Classifier as the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful hyperparameter tuning align with project objectives, ensuring optimal disorder predictions.

 Milestone 5: Project Files Submission and Documentation

 For project file submission in Github, Kindly click the link and refer to the flow:

<mark>Link to Git-hub</mark>:Click Here

 **Milestone 6: Project Demonstration**

This is achieved through video recording and making the model to predict the Disorder by giving the required inputs.

Drive Link for video demonstration: Click-here-to-watch-video